MOLECULAR BEAM OPTICAL ZEEMAN SPECTROSCOPY OF VANADIUM MONOXIDE, VO[a]

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Like almost all astronomical studies, exoplanet investigations are observational endeavors that rely primarily on remote spectroscopic sensing to infer the physical properties of planets. Most exoplanet related information is inferred from to temporal variation of luminosity of the parent star. An effective method of monitoring this variation is via Magnetic Doppler Imaging (MDI)[b], which uses optical polarimetry[c] of paramagnetic molecules or atoms. One promising paramagnetic stellar absorption is the near infrared spectrum of VO[d]. With this in mind, we have begun a project to record and analyze the field-free and Zeeman spectrum of the band. A cold (approx. 20 K) beam of VO was probed with a single frequency laser and detected using laser induced fluorescence. The determined spectral parameters will be discussed and compared to those extracted from the analysis of a hot spectrum[e].

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